

电力市场

基于微分进化算法的发电商机组出力综合性优化策略

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摘要:

提出了一种新的基于改进微分进化算法的电力市场机组出力综合性优化策略。根据机组出力与市场电价之间的协调联动关系, 以交易日售电总利润最大化为目标, 综合考虑机组运行成本、阀点效应、环境保护成本、实际报价风险系数, 构建了交易日机组分时段出力优化模型, 由此得出机组的综合性发电优化方案。设计了一种加入随机扰动因子进行变异以克服收敛早熟的微分进化算法对所构建的具有非线性、非凸特性的动态规划模型进行快速准确地求解。算例的仿真分析结果验证了该方法的可行性和优越性。

关键词: 电力市场 微分进化 优化策略 经济运行 环境保护 竞价风险

Comprehensive Output Optimization Strategy of Thermal Units in Electricity Market Based on Differential Evolution Algorithm

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Abstract:

A comprehensive output optimization strategy of thermal units in electricity market is proposed. According to the coordinated interactive relation between unit output and market price, taking maximized gross profit from electricity selling during the transaction day as objective and comprehensively considering operation cost of units, unit valve point effect, environment protection cost and risk exponent of actual quotation, a time-interval based optimal output model of units in transaction day is constructed, thus an optimized comprehensive generation scheme is obtained. A differential evolution algorithm to which stochastic disturbance is added for the variation of individuals to overcome premature convergence is designed to fast and accurately solve the proposed dynamic programming model which is nonlinear and non-convex. Results of case simulation show that the proposed method is feasible and predominant.

Keywords: electricity market differential evolution optimization strategy economic operation environmental protection bidding risk

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